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1. A method for forming a dielectric layer comprising:
providing a substrate;
forming over the substrate a patterned conductor layer;
forming upon the patterned conductor layer, while
employing a plasma enhanced chemical vapor deposition (PECVD), a silicon containing dielectric layer,
wherein when forming the silicon containing dielectric layer there is controlled a temperature of the substrate
by use of a backside cooling gas pressure so that there
is enhanced a line-to-line capacitance uniformity of the
patterned conductor layer.
2. The method of claim 1 wherein the substrate is
employed within a microelectronic fabrication selected from
the group consisting of integrated circuit microelectronic
fabrications, ceramic substrate microelectronic fabrications,
solar cell optoelectronic microelectronic fabrications, sensor
image array optoelectronic microelectronic fabrications and
display image array optoelectronic microelectronic fabrica-
tions.
3. The method of claim 1 wherein the patterned conductor
layer is selected from the group consisting of patterned
conductor metal layers, patterned conductor metal alloy
layers, patterned conductor polysilicon layers and patterned
conductor polycide layers.
4. The method of claim 1 wherein the patterned conductor
layer is formed to a thickness of from about 3000 to about
15000 angstroms.
5. The method of claim 1 wherein the plasma enhanced
chemical vapor deposition (PECVD) method is selected
from the group consisting of inductively coupled radio
frequency plasma enhanced chemical vapor deposition
(PECVD) methods, electron cyclotron resonance (ECR)
plasma enhanced chemical vapor deposition (PECVD)
methods and high density plasma chemical vapor deposition
(HDP-CVD) methods.
6. The method of claim 1 wherein the silicon containing
dielectric layer is selected from the group consisting of
silicon oxide dielectric layers, silicon nitride dielectric
layers, silicon oxynitride dielectric layers and fluorosilicate
glass (FSG) dielectric layers.
7. The method of claim 1 wherein the silicon containing
dielectric layer is formed to a thickness of from about 4000
to about 24000 angstroms.
8. The method of claim 1 wherein the temperature is
controlled within a range of from about 350 to about 450
degrees centigrade.
9. The method of claim 1, wherein the backside cooling
gas is comprised of helium.

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10. The method of claim 1, wherein the backside cooling gas pressure is from about 2 to 10 torr.

11. The method of claim 1, wherein the backside cooling gas pressure is from about 2 to 10 torr; the temperature of the substrate is from about 380 to 450° C.; and the silicon containing dielectric layer is comprised of FSG.

12. The method of claim 1, wherein the backside cooling gas pressure is about 4 torr; the temperature of the substrate is about 410° C.; and the silicon containing dielectric layer is comprised of FSG.

13. The method of claim 1, wherein formation of the PECVD silicon containing layer is achieved at a bias sputtering power of from about 100 to 4000 watts.

14. A method for forming a dielectric layer comprising:
providing a semiconductor substrate;

forming over the semiconductor substrate a patterned conductor layer;

forming upon the patterned conductor layer, while employing a plasma enhanced chemical vapor deposition (PECVD), a silicon containing dielectric layer, wherein when forming the silicon containing dielectric layer there is controlled a temperature of the substrate by use of a backside cooling gas pressure so that there is enhanced a line-to-line capacitance uniformity of the patterned conductor layer.

15. The method of claim 14 wherein the patterned conductor layer is selected from the group consisting of patterned conductor metal layers, patterned conductor metal alloy layers, patterned conductor polysilicon layers and patterned conductor polycide layers.

16. The method of claim 14 wherein the patterned conductor layer is formed to a thickness of from about 3000 to about 15000 angstroms.

17. The method of claim 14 wherein the plasma enhanced chemical vapor deposition (PECVD) method is selected

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from the group consisting of inductively coupled radio frequency plasma enhanced chemical vapor deposition (PECVD) methods, electron cyclotron resonance (ECR) plasma enhanced chemical vapor deposition (PECVD) methods and high density plasma chemical vapor deposition (HDP-CVD) methods.

18. The method of claim 14 wherein the silicon containing dielectric layer is selected from the group consisting of silicon oxide dielectric layers, silicon nitride dielectric layers, silicon oxynitride dielectric layers and fluorosilicate glass (FSG) dielectric layers.

19. The method of claim 14 wherein the silicon containing dielectric layer is formed to a thickness of from about 4000 to about 24000 angstroms.

20. The method of claim 14 wherein the temperature is controlled within a range of from about 350 to about 450 degrees centigrade.

21. The method of claim 14, wherein the backside cooling gas is comprised of helium.

22. The method of claim 14, wherein the backside helium cooling gas pressure is from about 2 to 10 torr.

23. The method of claim 14, wherein the backside helium cooling gas pressure is from about 2 to 10 torr; the temperature of the substrate is from about 380 to 450° C.; and the silicon containing dielectric layer is comprised of FSG.

24. The method of claim 14, wherein the backside helium cooling gas pressure is about 4 torr; the temperature of the substrate is about 410° C.; and the silicon containing dielectric layer is comprised of FSG.

25. The method of claim 14, wherein formation of the PECVD silicon containing layer is achieved at a bias sputtering power of from about 100 to 4000 watts.

26. (new) A method for forming a dielectric layer, comprising:

providing a substrate;

forming over the substrate, while employing a plasma enhanced chemical vapor

deposition (PECVD), a silicon containing dielectric layer, wherein

when forming the silicon containing dielectric layer there is controlled a temperature of

the substrate by use of pressure of a backside cooling gas.

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27. (new) The method of claim 26 wherein the silicon containing dielectric layer includes fluorosilicate glass (FSG).
28. (new) The method of claim 27 wherein the plasma enhanced chemical vapor deposition (PECVD) includes high density plasma chemical vapor deposition (HDP-CVD) methods.
29. (new) The method of claim 27 wherein the silicon containing dielectric layer is formed to a thickness of from about 4,000 to about 24,000 angstroms.
30. (new) The method of claim 27 wherein the temperature is controlled within a range of from about 350 to about 450 degrees centigrade.
31. (new) The method of claim 27, wherein the backside cooling gas is comprised of helium.
32. (new) The method of claim 27, wherein the backside cooling gas pressure is from about 2 to 10 torr.
33. (new) The method of claim 27, wherein the backside cooling gas pressure is from about 2 to 10 torr, the temperature of the substrate is from about 380 to 450 degrees centigrade, and the silicon containing dielectric layer is comprised of FSG.
34. (new) The method of claim 27, wherein formation of the PECVD silicon containing layer is achieved at a bias sputtering power of from about 100 to 4,000 watts.